

step or recess is not more than 3.05 meters (10 feet) in length.

(2) If a transverse watertight bulkhead has a step or recess of more than 3.05 meters (10 feet) in length, within the transverse extent of assumed damage, the two compartments adjacent to this bulkhead must be considered as flooded.

(3) If within the transverse extent of damage, a transverse bulkhead has a step or recess more than 3.05 meters (10 feet) in length that coincides with the double bottom tank top or the inner boundary of a wing tank, respectively, all adjacent compartments within the transverse extent of assumed damage must be considered to be flooded simultaneously.

(e) If a wing tank has openings into adjacent compartments, the wing tank and adjacent compartments must be considered as one compartment. This provision applies even where these openings are fitted with closing appliances except:

(1) Valves fitted in bulkheads between tanks which are controlled from above the bulkhead deck.

(2) Secured manhole covers fitted with closely spaced bolts.

(f) Only transverse watertight bulkheads that are spaced apart at least  $\frac{1}{3}(L)^{\frac{2}{3}}$  or 14.5 meters ( $0.495(L)^{\frac{2}{3}}$  or 47.6 feet), whichever is less, may be considered effective. If transverse bulkheads are closer together, then one or more of these bulkheads must be assumed to be non-existent in order to achieve the minimum spacing between bulkheads.

[CGD 79-153, 48 FR 38649, Aug. 25, 1983]

#### § 42.20-12 Conditions of equilibrium.

The following conditions of equilibrium are regarded as satisfactory:

(a) *Downflooding.* The final waterline after flooding, taking into account sinkage, heel, and trim, is below the lower edge of any opening through which progressive flooding can take place. Such openings include air pipes, ventilators, and openings which are closed by means of weathertight doors (even if they comply with § 42.15-10) or covers (even if they comply with § 42.15-30 or § 42.15-45(d)) but may exclude those openings closed by means of:

(1) Manhole covers and flush scuttles which comply with § 42.15-40;

(2) Cargo hatch covers which comply with § 42.09-5(b);

(3) Hinged watertight doors in an approved position which are secured closed while at sea and so logged; and

(4) Remotely operated sliding watertight doors, and side scuttles of the non-opening type which comply with § 42.15-65.

(b) *Progressive flooding.* If pipes, ducts, or tunnels are situated within the assumed extent of damage penetration as defined in § 42.20-11 (a) and (b), progressive flooding cannot extend to compartments other than those assumed to be floodable in the calculation for each case of damage.

(c) *Final angle of heel.* The angle of heel due to unsymmetrical flooding does not exceed 15 degrees. If no part of the deck is immersed, an angle of heel of up to 17 degrees may be accepted.

(d) *Metacentric height.* The metacentric height of the damaged vessel, in the upright condition, is positive.

(e) *Residual stability.* Through an angle of 20 degrees beyond its position of equilibrium, the vessel must meet the following conditions:

(1) The righting arm must be positive.

(2) The maximum righting arm must be at least 0.1 meter (4 inches).

(3) The area under the righting arm curve within the 20 degree range must not be less than 0.0175 meter-radians (0.689 inch-radians).

(4) Each submerged opening must be weathertight (e.g. a vent fitted with a ball check valve).

(f) *Intermediate stages of flooding.* The Commandant is satisfied that the stability is sufficient during intermediate stages of flooding.

[CGD 79-153, 48 FR 38649, Aug. 25, 1983]

#### § 42.20-13 Vessels without means of propulsion.

(a) A lighter, barge, or other vessel without independent means of propulsion is assigned a freeboard in accordance with the provisions of this subpart as modified by paragraphs (b), (c), and (d) of this section.

(b) A barge that meets the requirements of § 42.09-5(b) may be assigned

## § 42.20-15

Type “A” freeboard if the barge does not carry deck cargo.

(c) An unmanned barge is not required to comply with § 42.15-75, § 42.15-80(b), or § 42.20-70.

(d) An unmanned barge that has only small access openings closed by watertight gasketed covers of steel or equivalent material on the freeboard deck, may be assigned a freeboard 25 percent less than that calculated in accordance with this subpart.

[CGD 79-153, 48 FR 38649, Aug. 25, 1983]

### § 42.20-15 Freeboard tables.

(a) *Type “A” vessel.* (1) The tabular freeboard for Type “A” vessel shall be determined from Table 42.20-15(a)(1):

TABLE 42.20-15(A)(1)—FREEBOARD TABLE FOR TYPE “A” VESSELS

Length of vessel (feet)	Freeboard <sup>1</sup> (inches)
80 .....	8.0
90 .....	8.9
100 .....	9.8
110 .....	10.8
120 .....	11.9
130 .....	13.0
140 .....	14.2
150 .....	15.5
160 .....	16.9
170 .....	18.3
180 .....	19.8
190 .....	21.3
200 .....	22.9
210 .....	24.5
220 .....	26.2
230 .....	27.8
240 .....	29.5
250 .....	31.1
260 .....	32.8
270 .....	34.6
280 .....	36.3
290 .....	38.0
300 .....	39.7
310 .....	41.4
320 .....	43.2
330 .....	45.0
340 .....	46.9
350 .....	48.8
360 .....	50.7
370 .....	52.7
380 .....	54.7
390 .....	56.8
400 .....	58.8
410 .....	60.9
420 .....	62.9
430 .....	65.0
440 .....	67.0
450 .....	69.1
460 .....	71.1
470 .....	73.1
480 .....	75.1
490 .....	77.1
500 .....	79.0
510 .....	80.9
520 .....	82.7

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TABLE 42.20-15(A)(1)—FREEBOARD TABLE FOR TYPE “A” VESSELS—Continued

Length of vessel (feet)	Freeboard <sup>1</sup> (inches)
530 .....	84.5
540 .....	86.3
550 .....	88.0
560 .....	89.6
570 .....	91.1
580 .....	92.6
590 .....	94.1
600 .....	95.5
610 .....	96.9
620 .....	98.3
630 .....	99.6
640 .....	100.9
650 .....	102.1
660 .....	103.3
670 .....	104.4
680 .....	105.5
690 .....	106.6
700 .....	107.7
710 .....	108.7
720 .....	109.7
730 .....	110.7
740 .....	111.7
750 .....	112.6
760 .....	113.5
770 .....	114.4
780 .....	115.3
790 .....	116.1
800 .....	117.0
810 .....	117.8
820 .....	118.6
830 .....	119.3
840 .....	120.1
850 .....	120.7
860 .....	121.4
870 .....	122.1
880 .....	122.7
890 .....	123.4
900 .....	124.0
910 .....	124.6
920 .....	125.2
930 .....	125.7
940 .....	126.2
950 .....	126.7
960 .....	127.2
970 .....	127.7
980 .....	128.1
990 .....	128.6
1,000 .....	129.0
1,010 .....	129.4
1,020 .....	129.9
1,030 .....	130.3
1,040 .....	130.7
1,050 .....	131.0
1,060 .....	131.4
1,070 .....	131.7
1,080 .....	132.0
1,090 .....	132.3
1,100 .....	132.6
1,110 .....	132.9
1,120 .....	133.2
1,130 .....	133.5
1,140 .....	133.8
1,150 .....	134.0
1,160 .....	134.3
1,170 .....	134.5
1,180 .....	134.7
1,190 .....	135.0
1,200 .....	135.2
1,200 <sup>2</sup> .....	

<sup>1</sup> Freeboards at intermediate lengths of vessels shall be obtained by linear interpolation.